Issue 11.2024

LCD 2x16 - 6.68mm

INCL. CONTROLLER HD44780 OR COMPATIBLE

EA DIP162J-DN3LW
75 x 27 x 11 mm

EA DIP162-DN3LW
75 x 27 x 11 mm

EA DIP162-DHNLED
68 x 27 x 11 mm

FEATURES

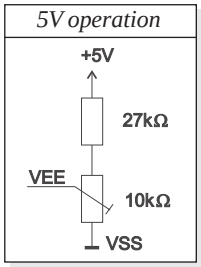
* HIGH CONTRAST LCD SUPERTWIST DISPLAY
* EA DIP162-DHNLED: YELLOW/GREEN WITH LED BACKLIGHT
* EA DIP162-DN3LW BLUE-WHITE WITH WHITE LED B/L., LOW POWER
* EA DIP162J-DN3LW BLACK&WHITE WITH WHITE LED B/L., LOW POWER
* INCL. HD 44780 OR COMPATIBLE CONTROLLER
* INTERFACE FOR 4- AND 8-BIT DATA BUS
* POWER SUPPLY +5V OR ±2.7V OR ±3.3V
* OPERATING TEMPERATURE -20~+70°C
* LED BACKLIGHT Y/G max. 150mA@+25°C
* LED BACKLIGHT WHITE max. 45mA@+25°C
* SOME MORE MODULES WITH SAME MECHANIC AND SAME PINOUT:
  -DOTMATRIX1x8, 4x20
  -GRAPHIC122x32
* NO SCREWS REQUIRED: SOLDER ON IN PCB ONLY
* DETACHABLE VIA 9-PIN SOCKET EA B200-9 (2 PCS. REQUIRED)

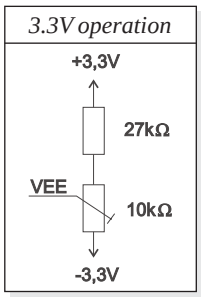
ORDERING INFORMATION

LCD MODULE 2x16 - 6.68mm WITH BACKLIGHT Y/G	**EA DIP162-DHNLED**
SAME IN BLUE-WHITE OPTIC.	**EA DIP162-DN3LW**
SAME IN BLACK&WHITE.	**EA DIP162J-DN3LW**
9-PIN SOCKET, HEIGHT 4.3mm (1 PC.)	**EA B200-9**
SUITABLE BEZEL (WINDOW 60.0x14.8 mm)	**EA 017-2UKE**
ADAPTOR PCB WITH STANDARD PINOUT PITCH 2.54mm	**EA 9907-DIP**

PINOUT

Pin	Symbol	Level	Function	Pin	Symbol	Level	Function
1	VSS	L	Power Supply 0V (GND)	10	D3	H / L	Display Data
2	VDD	H	Power Supply +5V	11	D4 (D0)	H / L	Display Data
3	VEE	-	Contrast adjust. (about 0V)	12	D5 (D1)	H / L	Display Data
4	RS	H / L	H=Command, L=Data	13	D6 (D2)	H / L	Display Data
5	R/W	H / L	H=Read, L=Write	14	D7 (D3)	H / L	Display Data, MSB
6	E	H	Enable (falling edge)	15	-	-	NC (see EA DIP122-5N)
7	D0	H / L	Display Data, LSB	16	-	-	NC (see EA DIP122-5N)
8	D1	H / L	Display Data	17	A	-	LED B/L+ Resistor required
9	D2	H / L	Display Data	18	C	-	LED B/L -





CONTRAST ADJUSTMENT

Contrast voltage for all displays of EA DIP162-D series is typ. 5V. That means that for 3.3V operation an additional negative voltage of min. 1.7V is required.
Display modules for -20..+70°C are equipped with an on-board temperature compensation. So there's no more need for contrast adjustment while operation anymore.

BACKLIGHT

Using the LED backlight requires an current source or external current-limiting resistor. Forward voltage for yellow/green backlight is 3.9~4.2V and for white LED backlight 3.0~3.6V. Please take care of derating for T_a>+25°C

Note: Do never drive backlight direct to 5V; immediately damage my happen !

CHARACTER SET

Character set shown below is already built in. In addition to that you are able to define up to 8 characters by yourself.

Lower 4 bit \ Upper 4 bit	0000 ($0x)	0010 ($2x)	0011 ($3x)	0100 ($4x)	0101 ($5x)	0110 ($6x)	0111 ($7x)	1010 ($Ax)	1011 ($Bx)	1100 ($Cx)	1101 ($Dx)	1110 ($Ex)	1111 ($Fx)
xxxx0000 ($x0)	CG RAM (0)		0	@	P	`	p		ー	タ	ミ	α	p
xxxx0001 ($x1)	(1)	!	1	A	Q	a	q	。	ア	チ	ム	ä	q
xxxx0010 ($x2)	(2)	"	2	B	R	b	r	「	イ	ツ	メ	ß	θ
xxxx0011 ($x3)	(3)	#	3	C	S	c	s	」	ウ	テ	モ	ε	∞
xxxx0100 ($x4)	(4)	$	4	D	T	d	t	、	エ	ト	ヤ	μ	Ω
xxxx0101 ($x5)	(5)	%	5	E	U	e	u	・	オ	ナ	ユ	σ	ü
xxxx0110 ($x6)	(6)	&	6	F	V	f	v	ヲ	カ	ニ	ヨ	ρ	Σ
xxxx0111 ($x7)	(7)	'	7	G	W	g	w	ァ	キ	ヌ	ラ	g	π
xxxx1000 ($x8)	CG RAM (0)	(	8	H	X	h	x	ィ	ク	ネ	リ	√	x̄
xxxx1001 ($x9)	(1)	)	9	I	Y	i	y	ゥ	ケ	ノ	ル	⁻¹	y
xxxx1010 ($xA)	(2)	*	:	J	Z	j	z	ェ	コ	ハ	レ	j	千
xxxx1011 ($xB)	(3)	+	;	K	[	k	{	ォ	サ	ヒ	ロ	ˣ	万
xxxx1100 ($xC)	(4)	,	<	L	¥	l	|	ャ	シ	フ	ワ	¢	円
xxxx1101 ($xD)	(5)	-	=	M	]	m	}	ュ	ス	ヘ	ン	£	÷
xxxx1110 ($xE)	(6)	.	>	N	^	n	→	ョ	セ	ホ	゛	ñ	
xxxx1111 ($xF)	(7)	/	?	O	_	o	←	ッ	ソ	マ	°	ö	

TABLE OF COMMAND

Instruction	Code										Description	Execute Time (max.)
	RS	R/W	DB 7	DB 6	DB 5	DB 4	DB 3	DB 2	DB 1	DB 0		
Clear Display	0	0	0	0	0	0	0	0	0	1	Clears all display and returns the cursor to the home position (Address 0).	1.64ms
Cursor At Home	0	0	0	0	0	0	0	0	1	*	Returns the Cursor to the home position (Address 0). Also returns the display being shifted to the original position. DD RAM contents remain unchanged.	1.64ms
Entry Mode Set	0	0	0	0	0	0	0	1	I/D	S	Sets the Cursor move direction and specifies or not to shift the display. These operation are performed during data write and read.	40µs
Display On/Off Control	0	0	0	0	0	0	1	D	C	B	Sets ON/OFF of all display (D) cursor ON/OFF (C), and blink of cursor position character (B).	40µs
Cursor / Display Shift	0	0	0	0	0	1	S/C	R/L	*	*	Moves the Cursor and shifts the display without changing DD RAM contents.	40µs
Function Set	0	0	0	0	1	DL	N	F	*	*	Sets interface data length (DL) number of display lines (L) and character font (F).	40µs
CG RAM Address Set	0	0	0	1	ACG						Sets the CG RAM address. CG RAM data is sent and received after this setting.	40µs
DD RAM Address Set	0	0	1	ADD							Sets the DD RAM address. DD RAM data is sent and received after this setting.	40µs
Busy Flag / Address Read	0	1	BF	AC							Reads Busy flag (BF) indicating internal operation is being performed and reads address counter contents.	-
CG RAM / DD RAM Data write	1	0	Write Data								Writes data into DD RAM or CG RAM	40µs
CG RAM / DD RAM Data Read	1	1	Read Data								Reads data from DD RAM or CG RAM	40µs

CREATING YOUR OWN CHARACTERS

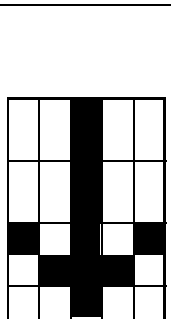
All these character display modules got the feature to create 8 own characters (ASCII Codes 0..7) in addition to the 192 ROM fixed codes.

1.) The command "CG RAM Address Set" defines theASCII code (Bit 3,4,5) and the dot line (Bit 0,1,2) of the new character. Example demonstrates creating ASCII code $00.

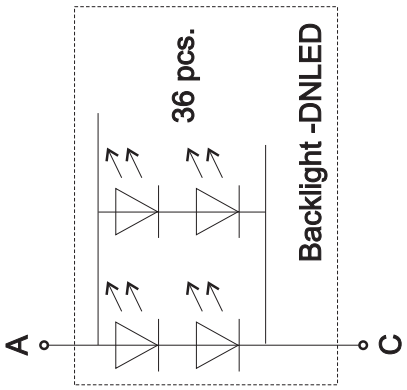
2.) Doing 8 times the write command "Data Write" defines line by line the new character. 8th. byte stands for the cursor line.

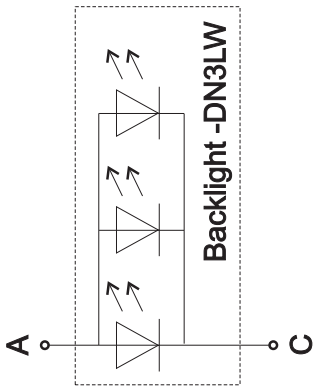
3.) The new defined character can be used as a "normal" ASCII code (0..7); use with "DD RAM Address Set" and "Data Write".

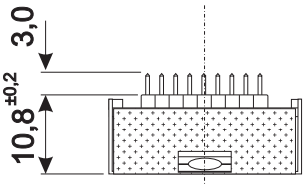
Set CG RAM Address										Data								
Adresse									Hex	Bit								Hex
										7	6	5	4	3	2	1	0	
0	1	0	0	0	0	0	0		$40				0	0	1	0	0	$04
					0	0	1		$41				0	0	1	0	0	$04
					0	1	0		$42				0	0	1	0	0	$04
					0	1	1		$43				0	0	1	0	0	$04
					1	0	0		$44	X	X	X	1	0	1	0	1	$15
					1	0	1		$45				0	1	1	1	0	$0E
					1	1	0		$46				0	0	1	0	0	$04
					1	1	1		$47				0	0	0	0	0	$00

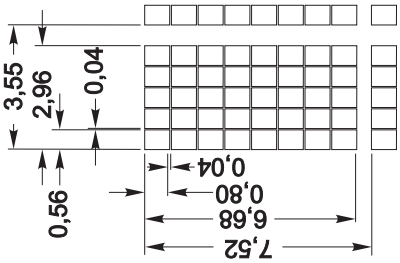


INITIALISATION FOR A 2 LINE DISPLAY / 8-BIT MODE											
Command	**RS**	**R/W**	**DB7**	**DB6**	**DB5**	**DB4**	**DB3**	**DB2**	**DB1**	**DB0**	**Remark**
Function Set	0	0	0	0	1	1	1	0	0	0	8-Bit Data Length, 2/4 lines, 5x7 Font
Display ON/OFF	0	0	0	0	0	0	1	1	1	1	Display on, Cursor visible, Cursor blink
Clear Display	0	0	0	0	0	0	0	0	0	1	Clear Display, Cursor Home
Entry Mode Set	0	0	0	0	0	0	0	1	1	0	Cursor Auto-Increment





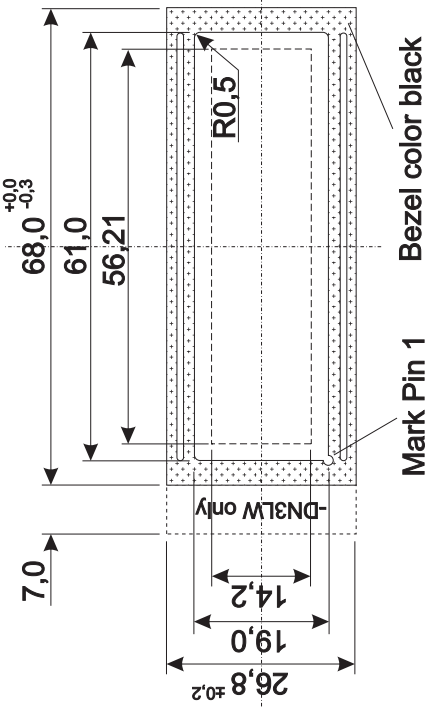


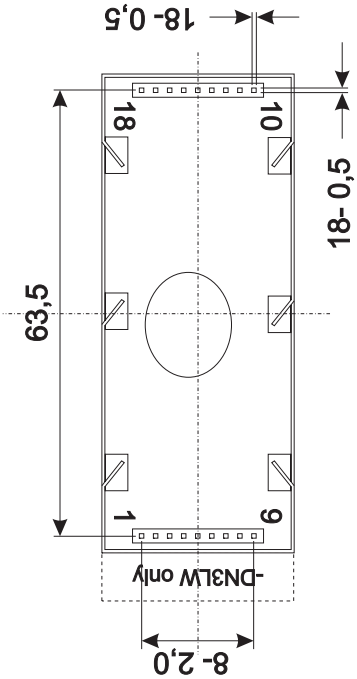


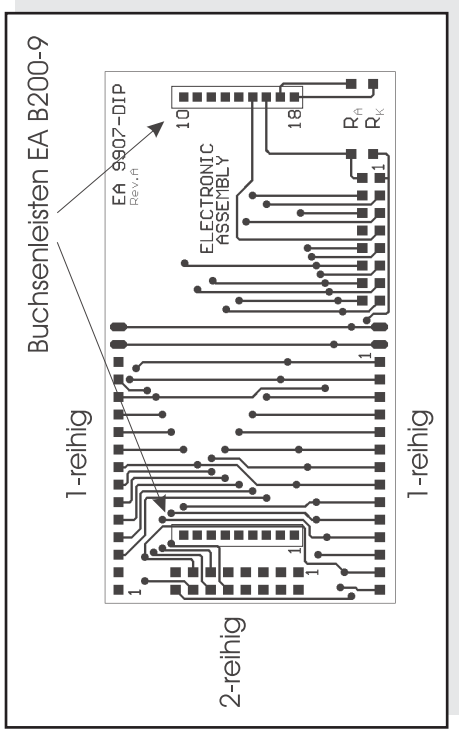
all dimensions are in mm

Test board for standard pinout 2.54mm
EA 9907-DIP

Dimensions







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